R Bailey
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Cruise Report

Massachusetts Cooperative Marine Geologic Program

Uniboom Seismic

Massachusetts Bay

Research Vessel - ASTERIAS

Cruise AST-8-79

16 August - 20 August, 1979

C.J. O'Hara

U.S. Geological Survey
Office of Marine Geology
Woods Hole, Massachusetts
02543

Introduction

A closely-spaced high-resolution subbottom profiling survey was conducted in Massachusetts Bay, western Gulf of Maine by the U.S. Geological Survey from August 16 through August 20, 1979. The offshore investigation is part of continuing marine geologic program, funded jointly by the Department of Public Works of the Commonwealth of Massachusetts and the U.S. Geological Survey, Office of Marine Geology, Woods Hole, Mass. The survey was carried out aboard the Woods Hole Oceanographic Institution Research Vessel ASTERIAS under Captain Dick Colburn. Provincetown, Boston and Gloucester served as ports of operation.

Objectives

1. Identify and map the geology and shallow structure of Massachusetts Bay.

2. Assess potential mineral resources - principally sand and gravel.

3. Evaluate the feasibility and environmental impact of offshore mining of mineral deposits and offshore disposal of solid waste material.

4. Evaluate potential containment and/or dispersal sites for offshore dumping of harbor dredge-spoil material.

5. Evaluate potential geologic hazards that may impact proposed petroleum pipe line corridors from offshore wells to processing facilities onshore.

6. Determine the geologic framework and Quaternary development of this part of the Atlantic Inner Continental Shelf.

7. Select sites for possible coring during summer 1980.

8. To Augment similar data obtained on the inshore area of Massachusetts Bay by Raytheon Company (May 1972) and further offshore by this office (GILLISS, Leg 2 - June 1979).

Personnel

Charles J. O'Hara	Chief Scientist, U.S.G.S.
Diane M. Eskenasy	Geologist WAE, U.S.G.S.
Lloyd E. DeKay	Geological Field Assistant, U.S.G.S.

Shipboard Systems

EG&G Uniboom Catamaran with mounted transducer

EG&G Trigger-Capacitor Bank

EPC Seismic Recorder (4100 series)

Teledyne Exploration Seismic Amplifier (Model 300)

Del Norte Hydrophone Steamer (30 element)

Krohn-Hite Band Pass Filter

Northstar 6000 Loran C Receiver

Northstar 6000 Loran C Repeater

Operational Procedures

Sound source/receiver position - 15 m astern of vessel

Sound source/receiver separation - 10 m

Ship speed over the bottom - 5 knots

Recorder sweep rate - 0.25 sec.

Sound source trigger interval - 0.50 sec.

Band Pass filter - low 400 Hz, high

Positional data - logged at 15 minute intervals and at major course changes

Loran C master - Seneca, N.Y., G.R.I. 9960

Loran C slave transmitters - W-Caribou, Me., and X-Nantuckat, MA.

Statistics

Scheduled ship time - 14 days 15 Aug - 28 Aug.

Working days at sea - 5 days 16 Aug - 20 Aug.

Down-time

Inclement weather - 0 days

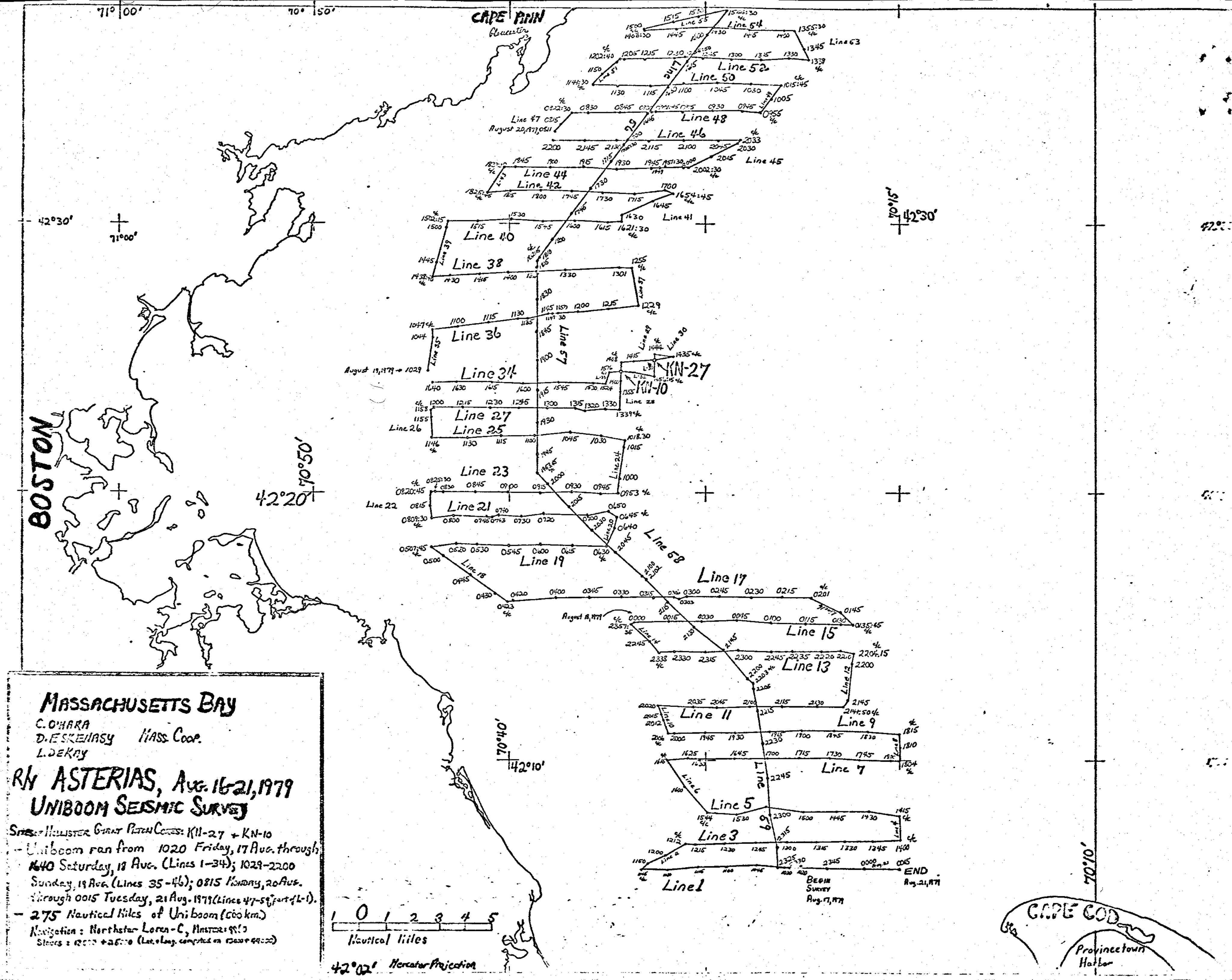
Equipment malfunction - 1 day

Actual survey time at sea - 4 days (survey completed ahead of schedule)

Ship tracks - continuous seismic profiling

Massachusetts Bay - 275 nautical miles (500 km)

Figure 1 shows are of investigation and seismic track line coverage.


CAPE ANN
Gloucester
BOSTON
CAPE COD
Provincetown Harbor
71°00'
70° 50'
70°50'
70°40'
70°15'
70°10'
42°30'
42°20'
42°10'
42°02'
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KN-27
KN-10
BEGIN SURVEY Aug. 17, 1979
END Aug. 21, 1979
August 18, 1979
August 19, 1979 → 1029
August 20, 1979, 0511
0 1 2 3 4 5
Nautical Miles
Mercator Projection
MASSACHUSETTS BAY
C. O'HARA
D. ESKENASY
L. DEKAY
MASS. COOP.
R/V ASTERIAS, AUG. 16-21, 1979
UNIBOOM SEISMIC SURVEY
Sites: Hollister Grant Piston Cores: KN-27 + KN-10
- Uniboom ran from 1020 Friday, 17 Aug. through
1440 Saturday, 18 Aug. (Lines 1-34); 1029-2200
Sunday, 19 Aug. (Lines 35-46); 0815 Monday, 20 Aug.
through 0015 Tuesday, 21 Aug. 1979 (Lines 47-59, part of L-1).
- 275 Nautical Miles of Uniboom (500 km.)
Navigation: Northstar Loran-C, Master 9960